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BOX 2

BRITISH INTELLIGENCE SURVEY

PRO 60/301

SOMALI REPUBLIC

Part VIII (C): MILITARY ENGINEERING RESOURCES

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This report supersedes the section on Water Supply and Construction Materials given in Part I of the General Report on Somalia and French Somaliland No. J/I/2/215 dated August 1958. It also supersedes British Intelligence Survey, The Somali Republic, Part VIII (C): Military Engineering Resources; Section I: Former Somaliland Protectorate No. D/6/VIII (C) (1) dated 2nd August, 1960, which should be destroyed and a destruction certificate rendered

JOINT INTELLIGENCE BUREAU
MINISTRY OF DEFENCE
LONDON

FEBRUARY 1964

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C.B. No 1. June 65
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C B No. 3 Jan. 68
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No. 3 Date: JANUARY 1968

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ITEMS ISSUED FOR THE FIRST TIME ARE MARKED WITH A DOUBLE ASTERISK.

Page 7, paragraph 7

**Government and Municipal Construction Agencies

The Ministry of Works and Communications is responsible for all government works services.

Page 9, paragraph 18

**Iron and Steel

There is an iron foundry in Mogadiscio.

Page 9, paragraph 22

**Mechanical Plant

A certain amount of USSR - manufactured road construction and civil engineering plant has been imported recently.

Page 9, paragraph 23

**Workshops

There is a military repair workshop in Mogadiscio.

Page 9, paragraph 24

**Water Supplies - General

Although there have been recent surveys of the country's water resources little development appears to have resulted, probably because funds are lacking.

Page 11, paragraph 37

Electric Power Supplies Organisation

Hydro-electric potential has been estimated at 300,000 kilowatts from various sources in the north, 20,000 kilowatts from the Scebeli River and 60,000 kilowatts from the Giuba River. A 25,000 kilowatt station on the Giuba would appear to be the most feasible project in the medium term.

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Page 12,
paragraph 40

Power Stations

Mogadiscio: The capacity of the Mogadiscio station in 1966 was 4,100 kilowatts and production 13.2 million kilowatt hours.

Page 15
Appendix B

Water Supplies, Townships and Settlements
Serial 6 "Hiram" in column 2 should read "Hiran".

Page 20,
Appendix D

Serial 8 "Ghiba" in column 4 should read "Giuba."
Serial 33 "sprin" in column 9 should read "spring".

Page 20,
Appendix D

Serial 13. Berbera The project for the new port will include improvements to water supplies so that shipping may be provided with fresh water.

Serial 25. Chisimaio Filtration and purification plant is to be provided as part of the new port scheme.

**Serial 54. Mogadiscio A water supply authority has been set up with the object of improving the water supply systems of the town and surrounding areas.

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Errata.	Page 13, Appendix A, Serial 19	"S.I.C.O." in Column 4 should read "S.I.C.A."
	Page 15, Appendix B, Serial 6	"Hiram" in Column 2 should read "Hiran".
	Page 20, Appendix D, Serial 8	"Ghiba" in Column 4 should read "Giuba".
	Page 22, Appendix D, Serial 33	"sprin" in Column 9 should read "spring".
	Page 29, Appendix F	"kW" in Column (h) of heading should read "kWh".

Page 7, paragraph 7

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Page 9, paragraph 22

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Pages 20 and 22, Appendix D

**Water Supplies: Townships and Settlements

Serial 13. Berbera - The project for the new port will include improvements to water supplies so that shipping may be provided with fresh water.
Serial 25. Chisimaio - Filtration and purification plant is to be provided as part of the new port scheme.

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No new information has been received since the isue of the BIS, therefore it is not up-dated, but remains valid in-so-far as our information goes.

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Page 7

Para 7 — Government and Municipal Construction Agencies

The Ministry of Works and Communications is responsible for all government works services.

Page 9

Para 18 — Iron and Steel

There is an iron foundry in Mogadiscio.

Para 22 — **Mechanical Plant

A certain amount of road construction and general civil engineering plant has been imported for USSR-aided projects but holdings, generally, are insignificant. A few plant agents are established at Berbera, Hargeisa and Mogadiscio.

Para 23 — Workshops

There is a military repair workshop in Mogadiscio.

Para 24 — Water Supplies - General

Although there have been recent surveys by foreign experts of the country's water resources, little development has resulted, probably because funds are lacking.

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Page 11
Para 37

Electric Power Supplies

Organisation

Hydro-electric potential has been estimated at 300,000 kilowatts from various sources in the north and 20,000 kilowatts from the Scebeli River and 60,000 kilowatts from the Giuba River in the south. The most likely project to materialise in the medium term would be a 25,000 kilowatt power station on the Giuba.

Page 12
Para 40

Power Stations

Mogadiscio The capacity of the Mogadiscio power station in 1966 was 4,100 kilowatts and production 13.2 million kilowatt hours.

Page 13
Appendix A

**Engineering Contractors and Stores Dealers

The following advertised their services in 1968:

Type of Service	Place	No of Firms
Building and civil engineering contractors	Merca	1
	Mogadiscio	4
Air conditioning equipment, dealers	Mogadiscio	2
Building materials, dealers	Berbera	1
	Hargeira	1
	Chisimaio	1
	Mogadiscio	17
Diesel engines, dealers	Mogadiscio	2
Electrical equipment, dealers	Mogadiscio	8
Hardware, ironmongery and tools, dealers	Mogadiscio	7
Heating equipment, dealers	Mogadiscio	1
Paints, dealers	Berbera	1
	Hargeisa	1
	Mogadiscio	7
Plant, machinery and equipment, dealers	Berbera	1
	Hargeira	1
	Mogadiscio	9
Pumps, dealers	Mogadiscio	1
Refrigeration, dealers	Berbera	1
	Mogadiscio	2
Timber	Mogadiscio	1

Page 15
Appendix B

Serial 6 - "Hiram" in column 2 should read "Hiran"

Page 20
Appendix D

Serial 8 - "Ghiba" in column 4 should read "Giuba"

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Pages 20-26
Appendix D

Water Supplies. Townships and settlements

Serial 13 - Berbera

The project for the new port will include improvements to water supplies so that shipping may be provided with fresh water.

Serial 25 - Chisimaio

Filtration and purification plant is to be provided as part of the new port scheme.

Serial 54 - Mogadiscio

A water supply authority has been set up with the object of improving the water supply systems of the town and surrounding areas.

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BRITISH INTELLIGENCE SURVEY ON SOMALI REPUBLIC

Part VIII (C): MILITARY ENGINEERING RESOURCES

(D/6/VIII (C)--First Revision, February 1964)

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Amendment		By whom entered	Date entered
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BRITISH INTELLIGENCE SURVEY ON SOMALI REPUBLIC

1. This report covers Military Engineering Resources in the Somali Republic and is one of a series dealing with subjects of particular interest to Service Staffs. The reports are also distributed to various Government departments. A distribution list is given on p. 30. The various Parts of the B.I.S. are issued separately for the convenience of users, and to speed up preparation and revision.

2. Other Parts of the B.I.S. which have been or will be issued in this series are as follows (date in brackets if issued).

III (B) Oil (August 1960)
V Transportation (June 1963)
VI Airfields (see paragraph 3 below)
VII Beaches and Landing Places (November 1960–June 1963, continuing)
VIII (A) Terrain, Climate and Map Coverage (1960–Former Somaliland Protectorate only)
VIII (B) Towns (September 1961)
IX Defences
X (A) Health (August 1962)
X (B) Telecommunications (July 1960)

3. Information on Airfields and Flying Boat Bases is to be found in the Airfield Handbook J.I.B. 5/72 and Regional Study J.I.B./J5/103/2. Ports are described in the J/4/4 series of Port Information Sheets. A general survey of the Somali Republic is included in the J.I.B. series of Intelligence Briefing Memoranda (No. J/114).

4. The information in this report is that available in J.I.B. as at February 1964.

5. Place name spellings are as far as possible those found on GSGS 4355 1:500,000 Series.

6. J.I.B. would welcome the views of users of this report on:

(*a*) any statement considered incorrect;
(*b*) any notable omissions;
(*c*) any means of improving the method of presentation.

7. New information received in J.I.B. will be promulgated as soon as possible by the issue of one of the following, depending on circumstances:

(*a*) A *new edition* of this report.
(*b*) *Check Bulletins.*—These will show the main changes affecting the information contained in this report and in any amendments to it issued under (*c*) below. The Check Bulletin should be *retained with this report and consulted whenever the latter is used.* (As Check Bulletins are cumulative, only the latest need be retained.)
(*c*) *Amendments* in the form of new pages, for incorporation in this report. It is important that such amendments should be correctly incorporated (and recorded on the sheet provided at the front of this report). In preparing Check Bulletins it is assumed that this has been done.

8. Requests for further information, including more detail than that in the text, should be made to:

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LONDON, W.C. 2.

Telephone: WHITEHALL 8474, EXT. 637,

or to any overseas J.I.B.

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APPENDIX E.—Northern Region—Electricity Plant and Supplies
APPENDIX F.—Southern Region—Electricity Plant and Supplies
MAP—In end pocket (general map of Somali Republic)

ABBREVIATIONS

A.C.	Alternating current
c.p.s.	cycles per second
D.C.	Direct current
g.p.d.	gallons per day
g.p.h.	gallons per hour
h.p.	horse power
kV.	kilovolt
kVA.	kilovolt ampere
kW.	kilowatt
kWh.	kilowatt hour
V.	volt

SOMALI REPUBLIC: MILITARY ENGINEERING RESOURCES

INTRODUCTION

General

1. *Aim.*—The aim of this report is to provide information on the extent to which the engineer aspects of military operations in the Somali Republic could be supported by local resources.

2. *Associated Intelligence Reports.*—Other factors, notably terrain, climate and transportation, which might affect the use or development of local engineering, water and electric power resources are dealt with in the related parts of this survey as enumerated on page 3, paragraph 2.

3. *Maps.*—The map issued with this report is intended to serve only as a guide. Points of detail arising from studies of this survey are located on Map GSGS 4355, 1 : 500,000. The northern part of the Somali Republic is covered by R.A.F. Aeronautical Chart, in one sheet at 1 : 1,000,000 scale (GSGS 4695); the best but not entirely adequate topographical series for this region is Series Y 623 (GSGS 4868) at 1 : 100,000. There is no comparable large-scale mapping for the south of the country.

National Resources

4. *The Economy.*—Much of the country is barren and sparsely populated. The economy is based on animal husbandry and agriculture, although settled cultivation is mainly confined to the valleys of the Uebi Scebeli and Giuba (Juba) Rivers and the areas between them. A large proportion of the population are nomadic herdsmen. Marine salt is the only mineral exploited at present; fairly substantial quantities of iron ore and traces of other minerals have however been found. The only indigenous fuel is wood although a low-grade coal was quarried before 1939; prospecting for oil is proceeding but so far only signs of wet gas have been discovered in the southern coastal strip. As far as construction materials are concerned, basic quarry materials, including limestone and gypsum, are abundant and there is a little timber, mainly of poor quality; all other engineering stores are imported.

5. *Industry.*—Manufacturing is chiefly confined to the processing of agricultural and animal products such as sugar refining, cotton ginning and leather tanning. There is no production of engineering significance and little likelihood of any development in the near future.

Types of Construction

6. Although there are some buildings of modern design and construction in a few of the larger towns, primitive methods of building prevail; housing being of a particularly low standard. Stone, cast-in-situ concrete and concrete block are used for Government and a limited amount of private construction, but wattle and daub or mud brick predominates in the dwellings of the majority of the settled population. Good roads and modern services are lacking and few buildings, even in the townships, are connected to mains water, drainage or electric power systems.

ENGINEER SUPPORT

Construction and Civil Engineering Industries

7. *Government and Municipal Construction Agencies.*—Prior to the formation of the independent Somali Republic in July 1960, the small Public Works Department (P.W.D.) of the British Somaliland Protectorate (now known as the Northern Region) and Somalia (Italian-administered Trust Territory, which is now known as the Southern Region) were the most important construction agencies. The municipal authorities of a few of the larger towns were also

responsible for certain of their own engineering services. There is no reason to believe that the situation has altered to any extent but efficiency has probably suffered through lack of finance and the departure of expatriate staffs. Details of the existing P.W.D. organisation are not available but the headquarters is at Mogadiscio with outstations at Hargeisa and probably a few other larger townships. The engineering facilities of the P.W.D. and municipal authorities are likely to be limited, even by African standards.

8. *The Private Construction Industry.*—The local civil engineering and construction contracting industry is of little significance. It is believed to be centred mainly on Mogadiscio with the industry mainly in the hands of Italian contracting firms. Particulars of the few known contractors are included in Appendix A.

Labour

9. There are probably a few expatriate qualified engineers still in Government service but few Somalis have been trained. Skilled artisans are at a premium; there is a local trades school and a few outstanding students have been sent abroad for training. Unskilled labour is available in urban areas.

ENGINEER RESOURCES

Timber

10. *Timber Supplies.*—Constructional timber is mostly imported from Ethiopia or Kenya. There are only small quantities of standing timber of constructional value in the Somali Republic. Small areas of relict cedar, juniper and box forests stretch in a broken line along the mountains south of the Gulf of Aden coastal strip. There is also a little timber along the banks of the Uebi Scebeli and Giuba Rivers; principally timber-size Acacia and Euphorbia but this is becoming exhausted by clearance for agriculture and extensive felling for the manufacture of banana crates. Mangrove swamps in coastal areas south of Chisimaio provide poles which are used along the coast for rough building purposes. Spiky acacia scrub of little constructional value is common throughout the country.

11. *Sawmills.*—There are no known sawmills although small factories manufacturing banana crates in the vicinity of the Italian-run irrigated banana plantations near the two rivers must possess woodworking machinery. The P.W.D. probably owns a few sawbenches. Stocks of sawn timber in the country are likely to be small, limited in size, range and type, and available only in the larger coastal towns.

Stone, Sand and Gravel

12. *Availability.*—Stone, suitable for concrete aggregate and road metal, sand and gravel are widely distributed and ample supplies are obtainable in most locations. Regional resources are given in Appendix B.

13. *Quarries.*—Small quarries exist near the towns or at locations convenient for road maintenance gangs. Mechanical methods of quarrying are rarely practised.

Cement and Associated Products

14. *Cement.*—There are no cement works; the nearest sources of supply are factories at Diredawa, Ethiopia and Bamburi, near Mombasa, Kenya. Local stocks of cement are likely to be small and obtainable in the larger towns only. There have been suggestions that a cement works should be established near Mogadiscio but no positive planning has occurred.

15. *Pre-cast Concrete Products.*—Concrete blocks are manufactured in small quantities in the larger towns only, mainly by hand.

16. *Lime.*—Wood-fired, primitive kilns near the main towns produce lime of poor quality as required.

Clay Products

17. Suitable clay deposits occur in the lower Uebi Scebeli Valley but there is no significant manufacture of burnt bricks, tiles or other clay products. Sun-dried bricks are made by natives throughout the riverine districts.

Iron, Steel and Other Manufactured Engineering Materials

18. All other manufactured engineering stores are imported. Only small stocks can be expected and the P.W.D. is the best source of supply. A list of known dealers in engineering stores is included in Appendix A.

Bitumen and Asphalt

19. Bitumenous road surfacing materials are imported. The P.W.D. is likely to hold small stocks.

Industrial Gases

20. Oxygen is manufactured at Villaggio Duca Degli Abruzzi (Villabruzzi).

Bridging Materials

21. Stocks of heavy steel sections and timber of bridging quality are likely to be negligible. A limited number of small tugs, launches and lighters are available at Berbera, Mogadiscio, Merca and Chisimaio. Other small craft, mainly native dhows and boats, are available around the coast and on the navigable stretches of the Giuba.

Mechanical Plant

22. Details of mechanical construction plant operating in the country are not available but only a small number of equipments are likely to be in use. The P.W.D. probably possesses a limited amount of road construction plant and common construction machinery such as concrete mixers, compressors and pneumatic tools. Some wheeled and perhaps a few crawler tractors may be used by Italian interests cultivating bananas and sugar cane in the valleys of the Giuba and the Uebi Scebeli. Load carriers are available in limited numbers in the main centres; there were 4,200 trucks in the country in 1960, many of which were in poor condition.

Workshops

23. The P.W.D. is believed to maintain its own vehicles, plant and machinery but its workshops probably contain only limited facilities. The Societa Agricola Italo–Somalia (S.A.I.S), a sugar refining concern and the largest industrial firm in the country, possesses mechanical repair workshops at Villaggio Duca Degli Abruzzi (Villabruzzi). A limited number of garages in the main centres only possess elementary repair facilities.

WATER SUPPLIES

General

24. *Glossary:*

(*a*) "*Balleh*" ("balli" or "uar").—A natural or artificial basin for collecting and storing rainwater.

(*b*) "*Deshek*".—A pool or swamp formed in a ground depression by the seasonal overflow from rivers or "tugs" (see (*c*) below).

(*c*) "*Tug*" (or "bohol").—A stream or wadi; nearly always seasonal.

The rocky beds of "tugs" are dry for most of the year but flow is sometimes torrential during the rainy season.

25. *Rainfall and General Water Resources.*—The country lacks adequate water resources. Large areas are almost waterless and others possess only exiguous supplies which are often unpleasantly mineralised and highly contaminated. Rainfall is irregular, varying from an annual average of less than 4 ins in the north to around 20 ins south of the Uebi Scebeli, with precipitation at the coast rather less than inland. In the south, rainfall occurs mostly as showers between April and November but in the north during November and December only. Run-off is rapid, particularly in the north and there is a high rate of evaporation. The general water supply characteristics are given in paragraphs 26 to 30 below; regional water supplies are detailed in Appendix C.

26. *Surface Water.*—The very limited surface water resources of the country are summarised below:

(*a*) *Rivers.*—The Uebi Scebeli and the Giuba (Juba) are the only rivers. The flow of both varies with the season but generally the Giuba remains perennial throughout its length whilst the Uebi Scebeli has a much reduced flow in the dry season and may dry out completely in places. Only the Giuba reaches the sea; before reaching the coast, the Uebi Scebeli turns to flow parallel to it and is finally lost among the intermittent marshes which extend from Genale almost to Gelib in the Giuba Valley. The rivers, which rise in Ethiopia, have no perennial tributaries in the Somali Republic. Improved natural reservoirs at Anole and Redidi on the middle reaches of the Giuba and at Coriole and Farkiero on the lower Uebi Scebeli conserve seasonal flow.

(*b*) *Streams.*—A few intermittent streams in the mountains of the north are generally absorbed by the porous sub-soil after short stretches of surface flow. Numerous dry "tugs" are found throughout the country. These carry surface flow after rain, sometimes torrential after storms, but afterwards soon dry out.

(*c*) *Pools.*—Overflow from the lower courses of rivers and "tugs" form "desheks"; some of these become lakes of considerable size from spate flow after storms. Rainwater pools or "ballehs" are a most important source of water; they are either natural or constructed specifically to impound water and depend entirely on rainwater catchment for replenishment. Many "ballehs", particularly those built recently by the Government with foreign aid, contain large quantities of water. The water in "desheks" and "ballehs" is often turbid and always highly polluted; supplies become exhausted as the dry season advances and areas dependent on them suffer severe drought.

Underground Water

27. *Underground Resources. General.*—Underground supplies exist at shallow to moderate depths at certain locations along the coast, in the mountainous areas of the north, in the south of the former Trust Territory and at scattered locations elsewhere. Such supplies are limited in quantity and are often brackish or mineralised. Except for a few selected areas, little is known of the hydrogeology of the country. Although some boreholes have been drilled, mainly around and to the east of Hargeisa and in the south of the country, only a small proportion of the country's water supplies are drawn from deep aquifers. The Government is engaged on a programme of well and borehole sinking, largely through foreign aid, and is gradually increasing the exploitation of ground-water. Details of known underground supplies are included in Appendix C.

28. *Springs.*—Underground supplies in the form of springs are found at a few locations in the northern mountains and, more rarely, in the banks and beds of seasonal "tugs".

29. *Wells.*—The native wells are usually hand dug, are unlined and usually less than 100 ft in depth. They are often dug in the beds or vicinities of "tugs" and are replenished by seasonal spates or sub-surface flow. Such wells are frequently filled by sand and boulders during floods and have to be re-excavated. Yields are often mineralised and polluted by seepage from above; as the dry season advances, the water level drops and quality worsens. Government-built wells are lined and provided with a coping to prevent contamination by back-flow. Only the more important wells, located mainly in the agricultural settlements in the valleys of the two rivers, are equipped with wind or engine-driven pumps.

30. *Boreholes.*—These vary from 100 to 1,000 ft in depth. Earlier bores have up to 10 ins casings but later drillings may be of different sizes. Engine-driven reciprocating borehole pumps, air-lifts or windpumps are more likely to be installed owing to the lack of electric power in practically all areas.

Operational Water Supplies

31. Water supply would be a serious limiting factor in military operations. There are adequate supplies only in the vicinity of the Uebi Scebeli and Giuba Rivers. Water is scarce in all other areas, particularly in the dry season. Away

from the rivers, limited supplies are obtainable in townships and settlements (see Appendix D) but in remote areas water is available only from a few widely scattered wells and pools. The sources that exist are likely to be mineralised or saline and almost certainly polluted. It would be necessary to secure and strictly control the available water points in many areas and often to transport water for long distances over poor communications. Field water supply and purification equipment, water tankers and possibly well-sinking rigs and pipeline equipment would be required by a force operating in the country. Water from all sources should be treated before drinking.

Responsibility for Water Supplies

32. The P.W.D. is generally responsible for potable water supplies. The larger municipalities are believed to provide and maintain their own systems.

Water Supply Plant and Stores

33. Stocks of water supply plant and stores are likely to be insignificant, with the P.W.D. the only effective source of supply. Installed plant in the Northern Region is still probably of United Kingdom manufacture; elsewhere it is likely to be of Italian design and to metric standards. Some recently installed plant may be of United States origin.

Urban Water Supplies

34. The larger townships are provided with mains water supply systems but these are usually inadequate for the populations they serve. Storage is limited, supplies are rarely treated and distribution covers only selected areas of the towns concerned. Few buildings are directly connected to the mains supplies and the majority of the public draws its water from communal points. The populations of town fringes are often dependent on water from wells or pools. Minor townships sometimes possess elementary systems consisting of a single water main from source to a storage tank which serves one or more public fountains or troughs with untreated water. Details of the water supply systems of most townships and settlements are given in Appendix D; some of this information is old and should be used only as a guide but as the country is developing very slowly much of the older intelligence is probably still correct in essentials.

Rural Water Supplies

35. Few villages are provided with developed water supply systems. The settled areas along the Uebi Scebeli and Giuba draw their water from the rivers. Elsewhere the villagers use the nearest well, " deshek " or " balleh " for domestic supplies and watering their cattle; a few more fortunate areas are served from boreholes. Water is usually extracted by hand or animal power except the pumped supplies from boreholes or Government-built wells where delivery to perhaps a single standpipe and trough is made. Much of the rural population is nomadic, moving its stock from place to place as the seasonal water situation dictates. The locations of many minor rural water sources primarily in the Northern Region are available in J.I.B. and can be supplied for particular areas on request.

SEWAGE DISPOSAL

36. There are no developed mains foul drainage or sewage disposal systems in the country. The few more important buildings containing water-borne facilities are connected to septic tanks or cesspits. Elsewhere, pit latrines are sometimes used but usually the most primitive habits prevail.

ELECTRICAL POWER SUPPLIES

Organisation

37. The Somali Republic is handicapped by a lack of indigenous fuel and hydro-electric potential. Electrical supplies throughout the country are meagre. In the Northern Region, apart from a number of small Government installations, supplies are virtually non-existent. The limited industrial activity in the Southern Region has, however, caused some development in the electrical field.

38. The Northern Region electricity supplies are all publicly owned and the plant has been kept up to date and efficiently maintained. Information on the plant in the Southern Region has been sparse since 1960, when it comprised about 100 generating units, mainly diesel driven and privately owned. The two largest owners being Azienda Elettro–Industriale de Vincenzi for the Mogadiscio plant, and Societa Agricola Italo–Somala for the plant at Villaggio Duca Degli Abruzzi. Electricity supplies are available in the larger towns and communities along the coast and the Uebi Scebeli and Giuba Rivers, where there have been European settlements. Many of the European-owned plantations outside these areas have small generators for private use, as also have Regional Governors, District Commissioners and some of the bigger police camps. Where possible, a limited amount of electricity is provided from these plants for public sale and lighting. The main plants at Mogadiscio and Villaggio Duca Degli Abruzzi have modern sets but the others date back to the 1920s in some cases.

Power Stations

39. Details of the Northern Region electric power installations are at Appendix E and those of the Southern Region at Appendix F. With reference to the latter, the information in the next paragraph is about one year later, so it should be considered when the Appendix is being used.

40. At the end of 1959 there were 100 electric generating plants in the Southern Region: 88 diesel or semi-diesel, 6 petrol, 2 gas and 4 steam. The total rated capacity of these was 6,942 kW. In 1959 production amounted to 8,832,551 kWh. Of this amount 8,229,545 (93 per cent) was in the Benadir District, 295,000 (3 per cent) in the Lower Giuba, and 308,006 (4 per cent) in the other four districts. Nearly half of the total production (4,099,695) was for public use in Mogadiscio. The Mogadiscio plant, about 1960, had two new sets installed, each of 1,370 h.p. with a rated output of 950 kW.

Transmission and Distribution

41. There are no transmission lines of any consequence in the country. In the Northern Region, Hargeisa, Berbera and Burao each have several miles of overhead lines operating at 3,300 V. and Hargeisa and Burao have one mile and half a mile respectively of underground cable at the same voltage. The system is A.C. 3-phase, 50 c.p.s., frequency uncontrolled, and consumers' voltage is 230/400 V. In 1959, the combined output of these three stations, the only ones of significance in the Northern Region, amounted to only 2,200,000 kWh., about half of the consumption in Mogadiscio in the same year.

42. In the Southern Region the system is mainly A.C. 50 c.p.s. with a consumers' voltage of 220 V.; in Mogadiscio it is 220/380 V. At Merca, however, the voltage is 110/220 V. and there are also some small private generating sets producing 110 V. Except for Mogadiscio and Villaggio Duca Degli Abruzzi, public supplies are available only at certain times. For example, at Merca supplies are limited to between 0600 and 2300 hrs and at Baidoa between 1800 hrs and midnight. The latter period is the most common.

Development

43. There are no indications that there will be any significant development in the electric power industry in the near future. Such improvements as are likely to be made will probably be confined to renewal of old plant and limited extensions of supplies to consumers.

APPENDIX A

SOMALI REPUBLIC

Engineering Contractors and Engineering Stores Dealers, 1963

Serial No.	Type of Contractor or Stores Dealer	Town	Contractor or Dealer	Address
	Building and Civil Engineering Contractors	*Merca*		
1			Branco Modesta	P.O. Box 25
		Mogadiscio		
2			Marco & Franco Marcoleoni...	P.O. Box 196
3			Hagi Mohamud Mohamed ...	P.O. Box 186
4			G. Rambelli	P.O. Box 51
	Air Conditioning Equipment	*Mogadiscio*		
5			Mitchell Cotts & Co. (Somalia) Ltd.	P.O. Box 22
6			Trespidi Rosolino	P.O. Box 423
	Building Materials (Importers)	*Chisimaio*		
7			Giovanni Dogliani	P.O. Box 42
		Mogadiscio		
8			Guido Fabri	P.O. Box 69
9			Falagnameria Meccanico ...	P.O. Box 109
10			Kassamali Gulum-Hussein & Bros.	P.O. Box 110
11			F. Monte & G. M. Locke ...	P.O. Box 359
12			S.A.I.E.M.A., E.A.	P.O. Box 32
13			Hagi Abdulla Scirua & Co. ...	P.O. Box 195
14			S.I.C.F.A.	P.O. Box 317
15			Societa Commerciale Italo Somala	P.O. Box 113
16			The Somalilands Trading Company	P.O. Box 9
	Diesel Engines and Equipment (Importers)	*Mogadiscio*		
17			Mitchell Cotts & Co. (Somalia) Ltd.	P.O. Box 22
18			S.A.I.E.M.A., E.A. (K.H., Deutz, Hanomag)	P.O. Box 32
	Electrical Accessories Fittings, etc. (Importers)	*Mogadiscio*		
19			S.I.C.O., F. Boero & Figlio, S.p.A. (G.E.C.)	P.O. Box 23
20			C. Maranzana (Max, Meyer) ...	P.O. Box 198
21			Giorgio Sardini	P.O. Box 345
22			Seferian & Co. (Somalia) Ltd. (A.E.G., " Rotos ")	P.O. Box 94
23			The Somalilands Trading Co.	P.O. Box 9
24			Carlo Tassi	P.O. Box 446
25			Francesco Tundo	P.O. Box 173
	Hardware, Ironmongery and Tools (Importers)	*Mogadiscio*		
26			Guiseppe Mazzoni	P.O. Box 376
27			S.A.I.E.M.A., E.A.	P.O. Box 32
28			S.I.C.F.A.	P.O. Box 317
29			Egidio Spinazze	P.O. Box 39
	Heating Equipment	*Mogadiscio*		
30			Rashid Mooraj (Aida.) ...	P.O. Box 106

Serial No.	Type of Contractor or Stores Dealer	Town	Contractor or Dealer	Address
	Paint and Varnish (Importers)	*Mogadiscio*		
31			M. Mohamedali, M. Abdulali & Bros.	P.O. Box 129
32			Ernst Goldschmidt	P.O. Box 274
33			Societa Commerciale Italo Somala	P.O. Box 113
34			The Somalilands Trading Company	P.O. Box 9
35			Egidio Spinazze	P.O. Box 39
	Refrigerators (Importers)	*Berbera*		
36			Cowasjee Dinshaw & Bros. ...	
		Mogadiscio		
37			F.I.M.A., S.p.A.	P.O. Box 344
38			Trespidi Rosolino	P.O. Box 423
	Timber (Importers)	*Mogadiscio*		
39			Societa Commercial Italo Somala	P.O. Box 113
	Agricultural Machinery and Equipment (Importers)	*Berbera*		
40			Paul Ries & Sons (Aden) Ltd. (Caterpillar)	
		Hargeisa		
41			Paul Ries & Sons (Aden) Ltd.	
		Mogadiscio		
42			S.I.C.A., F. Boero & Figlio S.p.A. (Caterpillar-Massey Ferguson)	P.O. Box 23
43			Fiat Somalia S.p.A.	P.O. Box 390
44			Seferian & Co. (Somalia) Ltd. (Allis Chalmers)	P.O. Box 94

APPENDIX B

SOMALI REPUBLIC

Stone, Sand and Gravel—Regional Resources

Serial No.	Region	Materials Available
	A.—Northern Region (Former British Somaliland Protectorate)	
1	Gulf of Aden Coastal Plains and Lowlands—The Guban (N. Borama, N. Hargeisa, N. Burao, Berbera and N. Erigavo Districts)	Volcanic and other hard rock in the west and extreme east; sandstone and limestone outcrops elsewhere. Sand and gravel abundant. Gypsum beds in the centre and east
2	Watershed Mountains and Hills (S. Borama, S. Hargeisa, Central Burao and Central Erigavo Districts)	Exposed hard metamorphic and volcanic rock in the west. Limestone and sandstone throughout the region. Sand and gravel generally available. Gypsum beds in eastern and west-central areas
3	Interior Plateau—Haud, Nogal and Sol Haud (S. Burao, S. Erigavo and Las Anod Districts)	Sandstone and gravel locally, and sand and gravel generally available in the Haud. Scarcity of hard rock in the Nogal drainage area and Sol Haud except for occasional hard limestone outcrops. Soft limestone and sandstone elsewhere. Gypsum is common throughout the region
	B.—Southern Region (Former Italian-administered Trust Territory (Somalia))	
4	Northern Somalia (Migiurtinia)	Hard rock in mountains to the north. Limestone, sand and gravel elsewhere, sandstone in some coastal areas
5	Mudugh Plain (Mudugh)	Really hard rock is scarce. Soft limestone, sand and gravel inland; sandstone and coral limestone in coastal areas
6	Central Somalia (Hiram or Uebi Scebeli)	Hard rock available only in the north-west of the region. Gravel only along the Uebi Scebeli River. Limestone, sand and gravel available elsewhere; gypsum beds
7	Southern Somalia (Alto Giuba or Upper Juba)	Granite is abundant around Bur Aceba in the south of the region and there is limestone and sandstone in central areas. Local shortages of hard rock in the north-east. Sand and gravel available along the Giuba River
8	Southern Somalia (Benadir)	Granite, sandstone and limestone available in the north-west. Pit sand and gravel occurs elsewhere except in the Uebi Scebeli swamps and where there is little accessible material
9	South-Western Somalia (Basso Giuba or Lower Juba)	No really hard rock available. Sand and gravel obtainable from the banks of the Giuba River and along the coast from beach material

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APPENDIX C

SOMALI REPUBLIC

Regional Water Supplies

Serial No.	Region	Surface Supplies	Underground Supplies
	A.—Northern Region (Former British Somaliland Protectorate)		
1	Gulf of Aden Coastal Plains and Lowlands —The Guban (N. Borama, N. Hargeisa, N. Burao, Berbera and N. Erigavo Districts)	No perennial surface water. In east-central areas where the hills almost reach the coastline, there may be occasional surface flow in otherwise dry " tug " beds during rain only; these sources are unreliable. Elsewhere there is not even seasonal surface water	Shallow wells and waterholes along the coast; fairly frequent west of Berbera but decreasing in numbers east of the town until they become rare. With a few exceptions, yields are less than 200 gallons per day from each source and water is usually brackish or gypseous Inland from the coast, there are widely scattered wells and waterholes throughout the Guban but yields are small and sometimes gypseous. A few deep wells and recently-drilled boreholes provide better supplies. A small number of mainly warm and mineralised springs, sometimes with large yields, are found principally at the base of the hills south-east of Berbera
2	Watershed Mountains and Hills (S. Borama, S. Hargeisa, Central Burao and Central Erigavo Districts)	A few free-flowing perennial streams are usually intermittent and disappear into the porous sub-soil after short stretches of surface flow. Many otherwise dry " tug " courses carry surface flow, sometimes torrential, during and shortly after rain only. Pools or " ballehs " conserve rainwater which gradually becomes exhausted as the dry season advances	Many wells sunk in or near " tug " beds provide small to moderate quantities of mainly good water around Borama, Hargeisa and Burao in the west; other similar wells are more widely scattered in the east. Wells sunk in limestone areas often provide good yields
3	Interior Plateau—Haud, Nogal and Sol Haud (S. Burao, S. Erigavo and Las Anod Districts)	No perennial surface water. " Tugs " draining south from the mountains into the Haud flow for short periods after rain only. Seasonal surface flow is usually for about 30 miles from the base of the hills except for the Burao Tug which continues for about 60 miles towards the Nogal. These seasonal sources quickly dry up. The meagre rainfall is conserved in " ballehs " in all areas of the Haud, Nogal and Sol Haud but these gradually dry out and water shortage is acute throughout the plateau	Underground supplies, although scarce throughout the plateau, are best in the Nogal where the water table after rain is as little as 6 to 10 ft below the surface in places. There is little underground water in the Haud or Sol Haud. Wells and waterholes are widely dispersed throughout the region, yields are always small and usually mineralised; many sources are seasonal only

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	B.—Southern Region (Former Italian-administered Trust Territory (Somalia))		
4	Northern Somalia—Northern Mountains, Darror Valley, Sol Haud and Nogal (Migiurtinia).	No perennial surface water, seasonal flow in " tugs " in the northern mountains, Darror (Tug Darror) and Nogal. Rainwater is conserved in "ballehs", particularly in the Sol Haud where there are few other sources of supply	There are few perennial springs, mainly of warm, mineralised water, in the northern mountains. Moderate yields are obtained from perennial or almost-perennial wells sunk in or near the beds of seasonal " tugs " in the northern mountains, Darror Valley and the Nogal. The most important groups of wells are at Meleden and Scusciuban (Darror), and Callis and Garoe (Nogal). Quality of underground water is generally good except in coastal areas where supplies are usually brackish. The Sol Haud lacks underground supplies and widely scattered wells and waterholes yield only small quantities of mineralised water; there are, however, numerous brackish wells at Gardo Oasis
5	Mudugh Plain (Mudugh)	There is no surface water except for a few unreliable pools and " ballehs " infrequently replenished by the poor rainfall and which are often dry	Underground supplies are scarce and highly mineralised. Shallow wells in the coastal dunes yield moderate supplies of brackish water from perched water tables. Wells at the Mudugh Oasis around Rocca Littoria and Baduen, and at Ghelinsor and at other places in the west of the area provide the best supplies. Some boreholes have been sunk in the north and west. Central areas are almost waterless
6	Central Somalia—Upper Uebi Scebeli Valley (Hiran)	The region is comparatively well-watered, the Uebi Scebeli being the main source of supply. The river bed is dry except for disjointed pools and waterholes for two or three months of the dry season; the water has a high mineral content which worsens as flow decreases. There are a number of seasonal " tugs " and away from the river water is conserved in " desheks " and " ballehs "	There are a number of springs at the sides of the valley and numerous wells yielding moderate to good supplies. Water is of good quality on the eastern side of the valley but mostly gypseous and bitter to the west. Away from the valley underground supplies become scarcer

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Serial No.	Region	Surface Supplies	Underground Supplies
7	Southern Somalia—including Upper Giuba Valley (Alto Giuba or Upper Juba)	Plentiful supplies available from the perennial Giuba. Storage works have also been constructed, notably at Anole and Redidi. Seasonal " tugs " flow in after rain, mainly from the west. Away from the valley there are many " ballehs " in the west, particularly near Lugh Ferrandi, Bardera and Oddur and around Iscia Baidoa, Dinsor and Bur Aceba. The " ballehs " contain water from two to nine months after rain. Surface water is scarce along the Kenya border to the east	There are springs at places on the east of the river up to about 50 miles above Bardera, yielding excellent supplies. Other springs exist at the base of the hill formation east of Iscia Baidoa. There are numerous wells along the river valley. East of the valley good wells exist in the beds of " tugs " at the foot of the hills along the Ethiopian border to the north-west of Lugh Ferrandi. Elsewhere along the Ethiopian frontier wells are about 20 miles apart Shallow wells about 15 ft deep are scattered in a broad arc running from Uegit, through Oddur and Tigieglo, towards Bulo Berti on the Uebi Scebeli. Other shallow wells exist around Iscia Baidoa, Dinsor and Bue Aceba. There are boreholes at Iscia Baidoa. Underground supplies are scarce along the Kenya border The quality of underground water in the region is generally good except in the areas of gypsum to the north and around Oddur
8	Southern Somalia—including Lower Uebi Scebeli (Benadir)	Although water in the lower reaches of the Uebi Scebeli diminishes and gradually disappears in the dry season, the various artificial storage basins, notably at Farkiero and Coriole, " desheks " and pools ensure supplies throughout the year. " Desheks " also conserve seasonal supplies on the Bohol Madagoi to the west of the region	There are numerous shallow wells along the coastal strip, particularly south of Mogadiscio; many yield brackish water and some are seasonal only. Many wells and boreholes in the vicinity of the lower Uebi Scebeli and its associated storage basins and "desheks" provide good supplies
9	South-Western Somalia (Basso Giuba or Lower Juba)	To the east, the Giuba and associated " desheks " provide supplies. To the west of the river there are numerous " ballehs " and the seasonal flow of Lach Dera is conserved by " desheks ", particularly west of Margherita. There is little surface water along the Kenya border except in the south of the region where some seasonal pools and swamps are present after rain	There are many wells in the Giuba Valley and along the coast to the east of the region. Wells and waterholes in the vicinity of Lach Dera yield supplies and there are boreholes at Afmudu, Mido and Gigis. Along the Kenya border there are seasonal wells in the south but there is little ground water in the north

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APPENDIX D

SOMALI REPUBLIC

Water Supplies—Townships and Settlements

Serial No.	Co-ordinate	Place	Source of Supply	Capacity g.p.d.	Storage Gallons	Treatment	Date of Information	Remarks
1	9° 45′ N., 44° 45′ E.	Adadleh	Waterhole	Adequate	None	None	Old	Waterhole in " tug " bed
2	2° 09′ N., 45° 07′ E.	Afgoi	Well	16,000–30,000	7,400	None	1945	Piped to standpipes only
3	0° 31′ N., 42° 04′ E.	Afmadu	Boreholes (2) Wells	5,500 (boreholes) Good yield from wells	Not known	None	1956	Boreholes probably equipped with wind-pumps
4	8° 57′ N., 46° 26′ E.	Ainabo	Well	12,000	Not known (probably none)	None	Old	Perennial well; gypseous
5	11° 58′ N., 50° 45′ E.	Alula	Wells	Abundant	Not known (probably none)	None	1945–56	Township obtains its supplies from wells as follows: (*a*) 3 or 4 wells at Cagioue—10–15 ft deep, large supplies but saline (11° 55′ N., 50° 45′ E.) (*b*) Well at Haidabahia—15–20ft deep, large supplies but saline (11° 57′ N., 50° 45′ E.) (*c*) Well at Hagi Alula—fresh water (in wadi 2½ miles east of Alula) (*d*) Well at Erbasc—fresh water. Well is concrete lined and equipped with engine-driven pump (4 miles from Alula)
6	3° 07′ N., 43° 38′ E.	Baidoa (Iscia Baidoa)	Spring Boreholes (2)	17,000–30,000 16,500 (boreholes)	7,400 (possibly more)	None	1945–56	A developed water point is established at the spring consisting of a pump, storage and piped supply to one standpipe. Boreholes 170 ft deep and equipped with pumps—probably wind-pumps. A third borehole was planned and may now be in operation

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Serial No.	Co-ordinate	Place	Source of Supply	Capacity g.p.d.	Storage Gallons	Treatment	Date of Information	Remarks
7	2° 23′ N., 45° 23′ E.	Balad	Well Boreholes (2)	1,100 (well) 26,500 (boreholes)	Not known	None	1956	Well is lined and equipped with wind or engine-driven pump. Boreholes, 210 and 330 ft deep, are fitted with wind or engine-driven pumps
8	2° 20′ N., 42° 17′ E.	Bardera	Not known (probably Ghiba River or wells in its vicinity)	9,000–18,000	1,000	None	1945–56	Piped to standpipes only. It was planned to sink a borehole in 1956
9	11° 17′ N., 41° 04′ E.	Bargal	Wells	Abundant	Not known	None	1950–56	Six wells, one probably equipped with wind-pump
10	4° 45′ N., 45° 12′ E.	Belet Uen	Wells	4,500–9,000	3,960	None	1945–53	Piped to standpipes only. There was a small pumping station in 1949
11	9° 29′ N., 50° 49′ E.	Bender Bela	Well Borehole	13,000	Not known	None	1956	Well, probably fitted with wind-pump 15 ft deep, yield 2,000 g.p.d. Borehole equipped with wind or engine-driven pump, 270 ft deep, yield 11,000 g.p.d.
12	11° 41′ N., 50° 27′ E.	Bender Merhagno	Wells	Abundant	Not known	None	1948	Lined wells, 10 ft deep
13	10° 25′ N., 45° 02′ E.	Berbera	Springs	Abundant	57,600	None	1960	Source is the warm springs (102°–110° F.) near Dubar in the foothills about 14 miles south of the town; water table is about 12 ft below surface and provides a copious perennial yield, of slightly brackish water Water is led from shallow pits into concrete collecting chambers and thence by gravity via a 6-in. asbestos-cement pipeline to an elevated steel storage tank just outside the town Piped supplies to more important premises and installations but the public is served mainly from standpipes

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14	11° 51′ N., 51° 03′ E.	Bereda	Waterhole	Abundant	Not known (probably none)	None	1945	Perennial waterhole, saline and cloudy
15	8° 37′ N., 48° 25′ E.	Bihen	Waterhole	1,000	Not known (probably none)	None	1943	Perennial, gypseous
16	8° 15′ N., 46° 20′ E.	Bohotleh	" Balleh "	Limited	Not known	None	1945	Quantity dependent on season
17	9° 56′ N., 43° 11′ E.	Borama	Wells	50,000	48,200	None	1960	Supplies are pumped to elevated tanks in the townships from wells in a " tug " bed about 5 miles to the north-east via a 2-in. rising main. Distribution is mainly to public standpipes
18	11° 17′ N., 49° 11′ E.	Bosaso (Bender Cassim)	Wells	Abundant	Not known (probably none)	None	1945–56	A number of wells in and about the township give good yields of saline water
19	1° 08′ N., 44° 03′ E.	Brava	Wells	10,000–20,000	11,000	None	1945	Piped supplies to standpipes only
20	3° 51′ N., 45° 34′ E.	Bulo Berti	Well	Not known	Not known	None	1953	Wind-pump serves elevated storage tank which is connected to a public fountain
21	2° 47′ N., 44° 05′ E.	Bur Aceba	Wells	12,000–18,000	1,100	None	1945–56	Wells about 60 ft deep. One developed water point serving a standpipe
22	10° 14′ N., 48° 44′ E.	Buran	Spring Waterholes (2)	Abundant	Not known (probably none)	None	1943	Perennial spring, gypseous; seasonal waterholes
23	9° 31′ N., 45° 34′ E.	Burao	Boreholes (4) Wells	80,000 (boreholes)	24,000 (possibly more)	None	1960	Public supply is drawn from the four boreholes, two 200 ft deep and two 400 ft deep; electric pumps at boreholes. Water is pumped via rising mains to elevated storage tanks whence it is piped to more important premises and to standpipes There are also many dug wells in the banks of the " tug "; water table here being at about 55 ft
24	11° 28′ N., 49° 52′ E.	Candala	Borehole	95,000	Not known	None	1961	Supplies of good water piped from boreholes at Butiyalo. 35,000 g.p.d. of brackish water also available from local well

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Serial No.	Co-ordinate	Place	Source of Supply	Capacity g.p.d.	Storage Gallons	Treatment	Date of Information	Remarks
25	0° 22′ N., 42° 32′ E.	Chisimato (Kismayu)	Borehole Wells	Not known	Not known	None	1956	Considerable supplies from shallow wells in addition to borehole yield
26	2° 24′ N., 42° 59′ E.	Dinsor	Wells	10,000	Not known (probably none)	None	1945–56	Brackish and cloudy water. Borehole drilled to 300 ft in 1954 was dry
27	5° 31′ N., 46° 24′ E.	Dusa Maren	Borehole Wells Waterholes	59,000	Not known	None	1945–56	Two wells and the borehole are lined and equipped with pumps. Wells—25–36 ft deep, borehole —210 ft deep. Water from wells is brackish
28	7° 59′ N., 49° 49′ E.	Eil	Wells	Not known	Not known	None	1953	Perennial
29	9° 55′ N., 47° 15′ E.	El Afwein	Well	10,000	Not known (probably none)	None	1945	Perennial, gypseous water
30	4° 40′ N., 46° 37′ E.	El Bur	Wells	50,000	Not known (probably none)	None	1956	18–20 ft deep saline water. One well lined and probably equipped with wind-pump
31	3° 51′ N., 47° 12′ E.	El Dere	Wells	8,500	Not known (probably none)	None	1945–56	20–55 ft deep, saline water. One well lined and probably equipped with pump.
32	9° 08′ N., 46° 13′ E.	El Dur Elan	Small stream	2,000	Not known	None	1945	Perennial, water of good quality
33	10° 37′ N., 47° 22′ E.	Erigavo	Borehole Spring Wells " Ballehs "	See remarks	See remarks	None	1960	Borehole—a borehole completed in 1960 yielded 1,800 g.p.d. on test and may now be providing limited piped supplies The spring and wells yield about 30,000 g.p.d. of heavily mineralised water, suitable only for livestock Two " ballehs " hold 1 million gallons total but are dependent on rainfall and are unreliable as a source Supplies of good water are brought by truck from Dayaha, 14 miles to the west where a perennial sprin yields about 400,000 g.p.d.

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34	6° 47′ N., 47° 26′ E.	Galcaio (Rocco Littorio)	Boreholes (2) Wells Waterhole	19,000 } Abundant	Not known	None	1945–56	Boreholes 315 ft and 540 ft deep equipped with wind or engine-driven pumps. One well lined and equipped. All boreholes and wells are perennial and yield water of good quality
35	9° 30′ N., 48° 05′ E.	Gardo	Wells	See remarks	Not known (probably none)	None	1952–56	Two wells of 81 ft and 108 ft deep, lined and equipped provide a total of about 4,500 g.p.d. A number of unlined wells yield limited supplies at about 65 ft deep. Yields from all wells tend to be brackish. Borehole drilled to 600 ft but dry
36	8° 24′ N., 48° 29′ E.	Garoe	Wells	See remarks	Not known (probably none)	None	1953–56	Some wells at depths of 30–100 ft yield good supplies of potable water; others yield only brackish water
37	0° 29′ N., 42° 46′ E.	Gelib	Wells	Not known	Not known (probably none)	None	1956	One well, lined and equipped yields 1,320 g.p.d. There are other wells in the area
38	9° 06′ N., 48° 37′ E.	Halin	Small stream	50,000	Not known (probably none)	None	1945	Gypseous
39	40° 39′ N., 47° 51′ E.	Harardera	Wells	25,000	Not known (probably none)	None	1945–56	Brackish and cloudy water at 30 ft. A better supply from a new well may now be available

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Serial No.	Co-ordinate	Place	Source of Supply	Capacity g.p.d.	Storage Gallons	Treatment	Date of Information	Remarks
40	9° 35′ N., 44° 04′ E.	Hargeisa	Wells Boreholes	150,000	250,000	Purification plant installed but may not be operative	1948–61	Water is short and rationing is necessary in the dry season The supply is based principally on a group of wells in the " tug " bed. Water is pumped by electrically-driven pumps via a 4-in. rising main to the 250,000 gallons reservoir located north of the town; it is then distributed by gravity to more important premises and to public stand-pipes A number of boreholes were drilled in 1959, one was dry and another yielded water too highly mineralised but two others at 750 ft and 900 ft are used to supplement supplies. Another borehole, north of the town, struck water at 1,000 ft in 1961 and is now probably in use Water has been brought by truck from Haraf, about 5 miles to the west, in times of drought
41	10° 53′ N., 46° 54′ E.	Heis	Wells	Limited	Not known (probably none)	None	1945	Three perennial wells, 15 ft deep. Yields of good quality but variable according to season
42	10° 33′ N., 51° 06′ E.	Hordio	Well	Abundant	Not known (probably none)	None	1952	Perennial well at Handa, about 9 miles to the north, yielding good water. Water was being drawn by hand in 1950 but the pumping installation, derelict in 1950, may have been reinstated
43	9° 09′ N., 47° 28′ E.	Hudin	Wells	Moderate	Not known (probably none)	None	1945	Perennial wells, gypseous water

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44	2° 46′ N., 46° 20′ E.	Itala	Wells	Limited	None	None	1950	Wells located 1–4 miles from the coast. Saline and in some cases not potable for humans
45	8° 59′ N., 46° 09′ E.	Kirit	Well	Not known	None	None	1945	Well 25 ft deep. Perennial but yield very small in dry season
46	8° 28′ N., 47° 31′ E.	Las Anod	Wells " Ballehs " Rain catchments	See remarks	See remarks	None	1958–61	The only potable water is obtained from rain catchments and " ballehs ", the latter located at Dio Hunaho about 5 miles away. The catchments are 54,000 sq. ft in area and feed into two underground storage tanks at 40,000 and 30,000 gallons capacity respectively. Roof catchment with storage in cisterns is practised The town well which yields 10,000 g.p.d. and other local wells are gypseous and yield unpalatable water Exploration for suitable borehole sites is continuing but no deep water-table had been located at the end of 1961
47	10° 10′ N., 46° 00′ E.	Las Dureh	Waterholes	Limited	None	None	1943	Several waterholes in " tug " bed. Yield about 200 g.p.d. of brackish water
48	11° 28′ N., 43° 16′ E.	Lawarda	Well	Limited	None	None	1945	Perennial well with installed pump; yield saline but potable
49	3° 48′ N., 42° 33′ E.	Lugh Ferrandi	Wells Giuba River	Abundant	Not known (probably none)	None	Old	Ground water is heavily mineralised
50	10° 58′ N., 47° 05′ E.	Mait	Well	300	None	None	1945	Perennial well, 8 ft deep, brackish yield
51	9° 55′ N., 44° 40′ E.	Mandera	Waterholes Small dam	50,000	24,000	None	1958	Water is pumped from waterholes and small dam in " tug " bed to two elevated storage tanks and piped thence by gravity to the prison and standpipes in the village. Three disused boreholes, combined capacities 2,300 g.p.h. exist and were used for military supplies during the war

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Serial No.	Co-ordinate	Place	Source of Supply	Capacity g.p.d.	Storage Gallons	Treatment	Date of Information	Remarks
52	0° 04′ N., 42° 45′ E.	Margherita	Giuba River Well	Abundant	Existing but capacity unknown	Not known	1953–56	Well 26 ft deep, lined and fitted with pump; yield 1,800 g.p.d. Pumped supplies from river to reservoir public served from standpipes
53	1° 43′ N., 44° 53′ E.	Merca	Wells	Not known (over 22,000)	None	Not known (probably none)	1953–56	Wells 75–90 ft deep; water probably saline
54	2° 04′ N., 45° 22′ E.	Mogadiscio	Wells Distillation	100,000 (estimated)	Existing but capacity unknown	None	1943–62	Municipal supply is pumped by electric pumps from deep wells, located about 2½ miles north-west of the town, to elevated storage tanks. The distribution system is gravity-feed, important buildings and installations only are directly connected; the public being served mainly from standpipes. Supplies are slightly brackish but potable About 14,000 g.p.d. is also produced by small distillation plants at the waterworks, power station, hospital, cold stores and airfield Supplies are also drawn by hand from shallow wells A plan for a new scheme to replace the existing inadequate system awaits provision of foreign aid funds
55	5° 21′ N., 48° 32′ E.	Obbia	Wells Sandscrapes	Moderate	None	None	1945	Wells in township 6–20 ft deep, brackish yields. Sandscrapes near seashore where water is rather less brackish

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56	4° 07′ N., 43° 54′ E.	Oddur	Wells	10,000	None	None	1945–56	Wells 20 ft deep, saline yields. A borehole is planned
57	10° 17′ N., 50° 14′ E.	Scusciuban	Wells	Not known	None	None	1952	
58	11° 00′ N., 43° 26′ E.	Silil	Borehole	9,000	7,200	None	1961	Borehole 240 ft deep; supplies pumped to overhead tank by 200 g.p.h. capacity pump. A further borehole of 14,400 g.p.d. capacity was awaiting pumping equipment and may now be operating
59	4° 02′ N., 44° 31′ E.	Tigieglo	Wells	10,000	None	None	1945–56	Perennial wells, yields of good quality. Borehole planned
60	2° 37′ N., 44° 54′ E.	Uanle Uen	Borehole	22,000	Not known (probably small capacity tank)	None	1953	Engine-driven pump, four standpipes and two troughs
61	3° 48′ N., 43° 15′ E.	Uegit	Wells	102,000	Not known (probably small capacity tank at one well)	None	1945–56	One well fitted with engine-driven pump serves a standpipe
62	2° 46′ N., 45° 31′ E.	Villagio Duca Degli Abruzzi (Villabruzzi)	Wells Borehole	22,600	4,400	None	1945–56	Developed water point serving standpipes. Borehole equipped with wind or engine-driven pump
63	11° 21′ N., 43° 29′ E.	Zeila	Well	16,000	22,200	None	1958	Water is pumped from a well in the " tug " at Tokhoshi, 5 miles to the west, by an engine-driven pump of 1,000 g.p.h. capacity. Main pipeline, 3 ins asbestos-cement, feeds a steel tank of 7,200 gallons and a masonry reservoir of 15,000 gallons capacity

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APPENDIX E

NORTHERN REGION
(Former British Somaliland Protectorate)

Electricity Plant and Supplies (Mid 1961)

Serial No.	Power Station	Sets	Generation and Transmission	Notes
	(*a*)	(*b*)	(*c*)	(*d*)
1	Hargeisa	2×326 kVA., 4-cylinder Petters Brush 2×500 kVA., 6-cylinder Brush	Generation at 400 V., 3-phase, 50 c.p.s., A.C. Stepped up to 3,300 V., for transmission	
2	Hargeisa Airport	1×21 kVA., 3-cylinder Lister (stand-by)	—	Now on public supply from Hargeisa power station
3	Hargeisa, Radio Somali	1×10 kVA., 2-cylinder Lister	230 V., single phase, 50 c.p.s.	Stand-by set
4	Berbera	6×75 kVA., 6-cylinder Leylands 2×137 kVA., 2-cylinder Petters Brush	—	Petters Brush sets brought from Hargeisa power station
5	Berbera (old)	—	—	Station and plant dismantled
6	Burao	3×70 kVA., Dormans	230/400 V., 50 c.p.s., A.C.	Supply now available to public consumers in addition to Government and military
7	Mandera	3×22 kW., 4-cylinder Listers	Supply 110 V., D.C. Peak load output 20 kW. Only one set can be used at a time	Supply to Government quarters and prison only
8	Mandera, Police Training Centre	2×18 kVA., 3-cylinder Listers	230 V., single phase, 50 c.p.s., A.C.	
9	Lawaada	1×7·5 kVA.	A.C.	For Government buildings only
10	Dayaha	2×16 kVA.	400 V., 3-phase, 50 c.p.s., A.C.	For Government buildings only (intermediate boarding school)
11	Upper Sheikh Secondary School	2×21 kVA., Dormans	230/400 V., 50 c.p.s., A.C.	

APPENDIX F

SOUTHERN REGION
(Former Italian-administered Trust Territory)

Electricity Plant and Supplies (1959*)

Serial No.	Region	Number and Types of Installations					Installed Capacity kW.	Output 1958 kW.
		Diesel	Petrol	Steam	Gas	Total		
	(*a*)	(*b*)	(*c*)	(*d*)	(*e*)	(*f*)	(*g*)	(*h*)
	Privately Owned for Public Consumption							
1	Benadir ...	15	1	4	2	22	4,362	5,071,511
2	Alto Giuba ...	1	1	—	—	2	11	4,000
	Total ...	16	2	4	2	24	4,373	5,075,511
	Publicly Owned for Public Consumption							
3	Migiurtinia ...	6	1	—	—	7	53	72,000
4	Mudugh ...	1	—	—	—	1	6	12,000
5	Hiran	2	1	—	—	3	28	55,000
6	Benadir ...	24	1	—	—	25	1,347	1,862,750
7	Alto Giuba ...	9	1	—	—	10	127	149,000
8	Basso Giuba ...	5	—	—	—	5	50	83,000
	Total ...	47	4	—	—	51	1,611	2,233,750
	Privately Owned for Private Consumption							
9	Benadir ...	12	—	—	—	12	709	1,128,000
10	Basso Giuba ...	4	—	—	—	4	110	180,000
	Total ...	16	—	—	—	16	819	1,308,000
	Grand Total	79	6	4	2	91	6,803	8,617,261

* See reference in paragraph 39 regarding later information.

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Miles 20 0 20 40 60 80 100 120 140 160 180 Miles

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